

Subject Index

A

Acenaphthene determination, 102
oxidation, 15, 24
recovery, 97
Acenaphthylene determination, 102
polymerization, 100
Acetylene production from benzole, 76
from coal, 76
Acridine oxidation, 42
Adhesives, 47, 49, 50, 53
Aniline determination, 125
oxidation, 42
Anisole oxidation, 15
production, 111
properties, 41
Anthracene decomposition, 100
determination, 18, 44, 77, 101, 102, 145
electrochemical oxidation, 24
extraction, 21, 22
oxidation, 24, 99
production, 100
properties, 23
purification, 21, 22, 96, 97
reaction with carbon dioxide, 100
recovery, 21, 22, 96
separation, 21, 22, 97
sulphonation, 25
Anthracene, Octahydro-
dehydrogenation, 100
isomerization, 100
oxidation, 23, 24
production, 23, 100
Anthracene Oil coking, 57
in effluent treatment, 9
oxidation, 24, 99
in production of carbon black, 59
purification, 21, 22
Anthracenes purification, 97
synthesis, 97
Anthraquinone determination, 101
production, 24
Anthraquinones analysis, 26
reduction, 26, 97
Anti-oxidants, 51, 131
Aromatic Hydrocarbons acylation, 25
alkylation, 16, 89, 90, 98
ammonolysis, 92
ammonoxidation, 92
analysis, 5, 18, 26, 78, 81, 92, 100, 101

Aromatic Hydrocarbons – continued

arylation, 90
cyclalkylation, 16
dealkylation, 17, 90, 91
disproportionation, 91
electrochemical oxidation, 24
extraction, 21, 22, 85, 96
hydrodealkylation, 90, 91
hydrogenation, 4, 91, 92, 100
hydrorefining, 90, 96
isomerization, 17, 91, 100
oxidation, 14, 15, 23, 30, 31, 53, 88, 89, 99, 107,
108, 115
oxygenation, 15
ozonolysis, 24
production, 4, 8, 12, 21, 33, 79, 83, 91, 98
in production of resins, 133
properties, 7, 14, 23, 86, 87, 88, 98
purification, 21, 22, 83, 84, 85, 96
recovery, 13, 21, 22, 78, 83, 85, 96
reduction, 25, 92
separation, 5, 21, 22, 30, 78, 83, 85
sulphonation, 32
synthesis, 97

Arosolvan Process, 85

Asphalt analysis, 29
properties, 29
in road construction, 127

B

Benzanthracene determination, 102, 145
ozonolysis, 25
properties, 23
reduction, 25
Benzanthracenes analysis, 101
dehydrogenation, 22
properties, 23
Benzene alkylation, 16, 17, 89, 90
benzylation, 16
crystallization, 12, 85
dehydrocondensation, 97
desulphurization, 12, 83, 84
determination, 7, 18, 92, 145
electroreduction, 92
extraction, 85
hydrodesulphurization, 84
hydrogenation, 92
oxidation, 14, 15, 30, 31, 107, 108
oxygenation, 15
production, 8, 12, 17, 25, 83, 85, 90, 91, 96
properties, 13, 86, 87, 88, 98
purification, 12, 83, 84, 85
recovery, 13, 85
refining, 12, 83, 84, 85
sulphonation, 12, 32

Benzene – continued
transalkylation, 91
Benzene, Ethyl-
dealkylation, 17
determination, 18
disproportionation, 91
in extraction of anthracene, 21
hydrogenation, 92
oxidation, 88
production, 16, 17, 91
in production of resins, 133
properties, 13, 87
recovery, 85
BenzeneCarboxylic Acids
analysis, 116
oxidation, 31
production, 24, 34, 88, 89
Benzenes, Alky-
alkylation, 16, 89
analysis, 18, 92, 116
dealkylation, 90, 91, 96
dehydropolymerization, 25
disproportionation, 17, 91
hydrodealkylation, 90, 91
hydrogenation, 86, 92
hydrorefining, 90
isomerization, 17, 91
oxidation, 14, 88, 89
production, 12, 16, 83, 89
properties, 13, 23, 86, 87, 88, 98
purification, 12, 85
recovery, 21, 85
transalkylation, 17, 91, 98
Benzindane
synthesis, 22
Benzocarbazole
determination, 44
synthesis, 121
Benzocarbazoles
analysis, 78
Benzochrysene
properties, 23
Benzofluoranthene
purification, 98
synthesis, 99
Benzofuran
synthesis, 114
Benzofurans
analysis, 78
recovery, 97
Benzole
acid washing, 12, 83
analysis, 93
desulphurization, 12, 83, 84
distillation, 12, 83, 84
in effluent treatment, 9
hydrocracking, 84
hydrodealkylation, 84
production, 12, 75, 83
in production of acetylene, 76
purification, 12, 83, 84, 85
pyrolysis, 76
recovery, 83
refining, 12, 83, 84
Benzoperylene
properties, 23
Benzophenanthrene
properties, 23
Benzopyrene
determination, 102, 145
Benzopyrenes
analysis, 145
synthesis, 22, 98
Benzoquinones
production, 115
properties, 26
Benzothiophens
properties, 23
synthesis, 22
Binaphthyl
dehydropolymerization, 97
Biphenyl
decomposition, 100
determination, 101
hydrogenolysis, 90
production, 97, 107
reaction with carbon dioxide, 100
Bipyridyl
production, 121
Bitumen
as binder in electrodes, 137
in carbon fibres, 136
in electrode manufacture, 137
modification with fatty acids, 128
with pitch, 45
with polymers, 45, 46
with tar, 45, 128
in pipecoatings, 48, 129
specifications, 48
testing, 129
water absorption, 49
in pipewrappings, 129
in plastic moulding materials, 50
properties, 104, 129
as road binder, 45, 127, 128
adhesion, 47
anti-skid properties, 46
penetration, 46, 104
solvent recovery, 46
specifications, 45
in slurry seals, 47
in surface dressing, 47, 128
full-scale trials, 47, 128
specifications, 47, 128
Brazan
recovery, 97

C

Carbamate Insecticides, 57
Carbazole
determination, 43
extraction, 21, 22, 97
oxidation, 24, 123
in production of resins, 54
properties, 23
recovery, 21, 22, 97
Carbazoles
analysis, 78
oxidation, 123
Carbon Black, 59, 76
production, 59, 76, 138
in production of graphite, 138
Carbon Fibres, 136
Carbon/Hydrogen Determination, 64, 143
Carbon Materials, 57, 136
Carboxylic Acids, Aromatic
analysis, 116
oxidation, 31
production, 21, 24, 25, 34, 88, 89
Catechol
alkylation, 131
determination, 35
etherification, 113
polymerization, 134
production, 34, 114

Catechol - continued
in production of insecticides, 57

Chrysene
determination, 102
properties, 23
synthesis, 97

Chrysenes
analysis, 26
properties, 23, 26

Coal
in briquettes, 131
caking, 4
carbonization, 3, 4, 30, 75, 76, 79
in electrical discharges, 4
entrained bed, 78
fluid bed, 75, 76
low temperature, 3, 75, 78, 80
static bed, 78
carbonizing properties, 3, 77
combustion, 51
crushing, 75
dissolution, 77
elasticity, 75
gasification, 4, 23, 75, 76, 77
hydrogasification, 4, 77
hydrogenation, 4
nitration, 3
origin, 77
pyrolysis, 3, 4, 76, 77
reaction with ammonia, 4
softening temperature, 5
structure, 6, 77
uses, 4, 131
volatile matter content, 77

Coalite Process, 3, 75

Coal Oil
distillation, 3, 75
hydrocracking, 79, 80
processing, 75
production, 3, 75, 76, 77

Coal Tar, High Temperature
air blowing, 8, 75
analysis, 3, 4, 5, 77, 78, 105, 145
ash removal, 79, 105
in briquettes, 75, 138
cleaning, 79
coking, 57, 75, 76, 136
dehydration, 7, 78, 79
delayed coking, 57
distillation, 5, 7, 77, 79, 106
distillation analysis, 3
in electrodes, 8, 59, 138
emulsions, 78, 128
preparation, 129
stabilization, 128
in enamels, 48, 129
application, 129
cost, 48
performance, 48
specifications, 129
extraction, 8, 78
in fuels, 50
hydrocracking, 8, 79
hydrogenation, 8, 79
modification with bitumen, 45, 128
with fatty acids, 128
with polymers, 45, 47, 127, 128, 129
oxidation, 8
in paints, 48, 129
cost, 48
performance, 48
in pipecoatings, 48, 129
application, 48, 129

Coal Tar, High Temperature - continued
with cathodic protection, 48
cost, 48
history, 48
specifications, 48
water absorption, 48
in pipewrapping tapes, 50, 129
polymerization, 75
processing, 3, 7, 45, 75, 78, 127
production, 3, 4, 45, 75, 76
properties, 3, 8, 75, 127
purification, 7, 79
pyrolysis, 5, 76
recovery, 75
recovery from effluents, 9
in road binders, 8, 45, 127, 128
adhesion, 45, 47
ageing, 47, 127, 128
anti-skid properties, 45, 127, 128
determination of content, 46
durability, 127
manufacture, 127
surface dressing, 45, 127, 128
viscosity, 46, 127
volatility, 127
weathering, 127
wettability, 46
separation, 3, 78, 79
in soaps, 139
in soil stabilization, 47
solvent fractionation, 105
stabilization, 79
sulphur removal, 7
thermal treatment, 75, 76
in timber preservation, 55
viscosity, 46, 127
yield from coal, 3, 75

Coal Tar, Low Temperature
analysis, 5, 6, 77, 78
centrifuging, 7
composition, 6, 77, 78
cracking, 8
distillation, 6, 7, 75, 80
extraction, 6
hydrocracking, 8
hydrogenolysis, 80
processing, 7, 75, 80
production, 75, 76, 77, 78
purification, 7
in road binders, 128

Coal Tar Fractions
analysis, 5, 6, 77, 78, 92, 101
dealkylation, 91
distillation, 7, 75, 78
hydrocracking, 79, 80
hydrogenation, 79
hydrogenolysis, 33
production, 3, 4, 5, 8, 12, 75, 76
in production of detergents, 6
of pesticides, 136
of proteins, 6
purification, 12, 21, 22, 75
pyrolysis, 76
recovery, 12, 13, 75
treatment, 3, 21, 22, 75, 76, 119, 120
use in sealing liquids, 139

Coal Tar Fuels, 50, 131

COED Process, 76

Coke
production 3, 4, 5, 57, 58, 75, 76, 137
in production of briquettes, 75
of electrically conductive sheets, 130
of electrodes, 59, 137

Coke - continued

- of pipewrapping tapes, 130
- properties, 76
- 2,3,5-Collidine**
 - determination, 124
- 2,3,6-Collidine**
 - separation, 40
- 2,4,5-Collidine**
 - determination, 124
- 2,4,6-Collidine**
 - purification, 119
 - separation, 40, 119
- 3,4,5-Collidine**
 - determination, 124

Collidines

- separation, 40

Coronene

- properties, 23

Corrosion, 7

- in tar distillation plant, 7

Coumarone

- polymerization, 51

synthesis, 34

Coumarone Resins, 51, 132

- modification with butadiene, 51
 - with carbazole, 52
 - with fluorene, 52
 - with formalite resins, 52
 - with phenanthrene, 52
- production, 51, 132
- in production of paints, 133
- purification, 51

Creosote

- analysis, 79, 100

- in froth flotation of coal, 139

- in wood preservation, 54, 135

- for agricultural silos, 55

- durability, 55

- code of practice, 54

- cost, 54

- efficiency, 55, 135

- failure, 55

- field tests, 55, 135

- fortification with copper compounds, 55

- fungicidal activity, 55

- glossary of terms, 56

- incizing of poles, 135

- marine exposure tests, 135

- marine grade, 135

- modification with petroleum oil, 135

- performance, 55

- pressure treatment, 54, 135

- Rüping process, 54

- service life, 54

- in warm harbours, 54, 135

- stake tests, 55, 135

- testing, 55, 135

- toxicity, 55

Cresol, meta-

- alkylation, 113

- oxidation, 34

- preparation, 31, 32, 111

- production, 33, 111, 112

- properties, 30, 110

- synthesis, 31, 33, 111

Cresol, ortho-

- determination, 7, 35

- preparation, 31, 32, 33, 110, 111

- production, 33, 110, 111, 112

- properties, 110

- in separation of collidines, 40

- of lutidines, 40

- synthesis, 31, 33, 108, 111

Cresol, para-

- acetylation, 113

- alkylation, 113

- oxidation, 114

- preparation, 31, 32, 33, 108, 111

- production, 31, 33, 111, 112

- properties, 30, 110

- reaction with carbon dioxide, 34

- separation, 30

- synthesis, 31, 33, 108, 109, 111

Cresols

- alkylation, 110, 113

- analysis, 7, 35, 36, 116

- in froth flotation of coals, 139

- in fungicides, 136

- isomerization, 113

- preparation, 30, 31, 32, 33, 110, 111

- production, 33, 110, 111, 112, 114

- properties, 33, 110

- purification, 30, 106

- reaction with formaldehyde, 7

- recovery, 30, 106

- separation, 30

- synthesis, 30, 31, 33, 107, 110

Crystallization, 70, 71, 150

Cumene

- dealkylation, 17

- oxidation, 31, 88, 107

- production, 91

- properties, 17

- purification, 86

Cyclohexane

- properties, 13, 14, 87

Cyclohexanol

- dehydrogenation, 31, 107

Cyclopentadiene

- polymerization, 92

Cyclopentadienes

- hydrogenation, 131

- in production of jet fuels 131

Cymene, ortho-

- production, 90

Cymene, para-

- dealkylation, 17

- disproportionation, 91

- production, 89, 90

Cymenes

- production, 16, 89, 90

D

Detergents

- from alkylbenzenes, 16

- from I.T. tar fractions, 6

Detol Process, 90

Diphenylmethane

- properties, 14

Diquat, 56

- fungicidal activity, 135

- mode of action, 56, 136

- phytotoxicity, 57

Distillation, 69, 70, 149, 150

Durene

- oxidation, 23

- production, 16, 89

- in production of resins, 133

E

Effluents

- analysis, 9, 81

- biological treatment, 9, 80, 81

- dephenolation, 3, 9, 81

Effluents - continued
disposal legislation, 80
distillation, 81
estimation of phenols in, 9, 81
of pyridines in, 10, 81
extraction, 9, 81
oxidation, 9
oxygen demand, 9
purification, 3, 9, 80, 81
treatment, 9, 80, 81
Enthalpimetry, 66, 146
Entropy Measurement, 68, 147

F

Fluoranthene
determination, 102
Fluoranthenes
production, 22
synthesis, 98
Fluorene
oxidation, 24
recovery, 97
Fluorenone
production, 24
ring expansion, 22
Fungicides
history, 56
toxicity, 56
Fraass Brittle Point, 68, 140

G

Gas Chromatography, 7, 65, 144
capillary columns, 65, 144
coated capillary columns, 65
detectors, 65
gel permeation, 65
packed columns, 65
photo-ionization detector, 65
porous layer open tubular columns, 65, 145
preparative scale, 65, 145
pyrolysis, 65, 145
sandwiched capillary columns, 145
silylation, 145

H

Halogens Determination, 64, 143, 144
HDA Process, 91
Herbicides, 56, 121, 136
Hydrogen Cyanide
production from coal, 4
Hydroquinone
determination, 36
etherification, 113
polymerization, 134
production, 34, 119
properties, 110
synthesis, 31

I

Indanol
etherification, 113
Indan
hydrocracking, 25
Indans
production, 16
Indene
polymerization, 51, 52, 132

Indene - continued
production, 96
in production of plasticizers, 52
properties, 98
Indene-Coumarone Resins, 51, 132
modification with butadiene, 51, 132

with carbazole, 52
with fluorene, 52
with formalite resins, 52
with phenanthrene, 52
production, 51, 132
properties, 132
purification, 51
uses, 132, 133

Indole
chlorination, 21
determination, 81
hydrogenation, 42
in inhibitors, 60
recovery, 120

Indoline
hydrogenation, 42
production, 42

Insecticides, 57, 92, 136

Isoforming Process, 91

Isophthalic Acid
production, 53, 88

Isoquinoline
determination, 43, 124
hydrogenation, 42
properties, 41, 122
recovery, 39
separation, 39, 43

L

Latent Heat Measurement, 147

Lepidine
determination, 125
properties, 122

Light Oils, 12, 83
acid washing, 83
desulphurization, 83
distillation, 96
hydrogenation, 83
production, 3, 8, 12

Lignite
carbonization, 77

Lignite Pitch
delayed coking, 57, 137

Lignite Tar
analysis, 77, 78
composition, 77, 78
distillation, 78
fractionation, 77
production, 77
treatment, 77

Liquid Fuels, 50, 131
production, 4, 76, 80
from coal, 4, 76
from l.t. tar, 8, 80
from shale oil, 4

Litol Process, 90

2,3-Lutidine
recovery, 39
reduction, 123
separation, 39

2,4-Lutidine
determination, 124
purification, 119
recovery, 39
reduction, 123

2,4-Lutidine – continued

separation, 39, 119
2,5-Lutidine
recovery, 40
reduction, 123
separation, 40
2,6-Lutidine
dealkylation, 41
in decorative folks, 60
determination, 124
properties, 122
purification, 119
separation, 119
3,4-Lutidine
determination, 123
reduction, 123
3,5-Lutidine
determination, 123
reduction, 123
separation, 40
Lutidines
purification, 119
recovery, 39
reduction, 123
separation, 39

M

Maleic Anhydride
production, 88
Melliphanic Acid
production, 23
Mesitylene
decomposition, 100
hydrogenation, 92
oxidation, 15
in production of resins, 133
MHC Process, 17
Middle Oils, 21, 96
analysis, 6, 26
cracking, 8
hydrogenation, 83
production, 3, 75, 80
in production of liquid fuels, 51
refining, 3, 75

N

Naphtha
analysis, 6, 26
cooking, 58
desulphurization, 83
polymerization, 51, 132
in production of DDT, 136
Naphthalene
acid washing, 96
acylation, 25, 97
alkylation, 98
decomposition, 100
desulphurization, 21
determination, 18, 26, 77, 93, 101
distillation, 21, 96
extraction, 21, 23
hydrogenation, 99
hydrorefining, 96
oxidation, 31, 52, 53, 133, 134
ozonolysis, 25
production, 5, 8, 21, 33, 79, 83, 91, 96, 97
in production of resins, 133
properties, 23, 98
purification, 21, 96
recovery, 21, 83, 96
sublimation, 21

Naphthalene – continued

succinylation, 97
Naphthalene-carboxylic Acids
production, 24

Naphthalene Oil
crystallization, 21, 96
distillation, 21, 96
production, 21
treatment, 96

Naphthalene, Tetrahydro-
determination, 101
in dissolution of coal, 77
as hydrogen donor, 91
oxidation, 99
purification, 99

Naphthalenes, Alkyl-
alkylation, 25, 99
analysis, 101
dealkylation, 97
dehydrocyclization, 25
dehydrogenation, 25
isomerization, 25
in jet fuels, 51
oxidation, 15
ozonolysis, 25
production, 35, 99
properties, 23, 87, 98
purification, 21

1-Naphthol
alkylation, 35
determination, 116
etherification, 113
production, 31, 109
synthesis, 99

2-Naphthol
determination, 116
etherification, 113
production, 109
properties, 98

Naphthols
analysis, 37, 116
etherification, 113
as stabilizer for fuel, 51
for plastics, 51
for synthetic rubber, 51

Naphthoic Acids
production, 21
Naphthoquinone
recovery, 53, 134
1-Naphthylamine
determination, 43
2-Naphthylamine
determination, 43
properties, 98
Nitrogen Determination, 64, 143

O

Oxygen Determination, 64, 143

P

Paraquat, 57, 135
fungicidal activity, 135
identification, 57
mode of action, 136

Perylene
determination, 102
purification, 98
synthesis, 98

Pesticides, 56, 136

Petroleum Coke, 58, 137

Petroleum Coke - continued
 properties, 58

Petroleum Pitch
 as binder in carbon electrodes, 58
 cooking value, 58
 properties, 58

Phenanthraquinone
 photochemical reaction with benzene, 92
 production, 24

Phenanthrene
 decomposition, 100
 determination, 101, 102, 145
 extraction, 21, 22, 97
 hydrogenation, 23, 100
 oxidation, 24, 99
 properties, 23
 purification, 21
 recovery, 97
 separation, 21, 22, 97
 synthesis, 97
 sulphonation, 25

Phenanthrene, Octahydro-
 isomerization, 23, 100
 oxidation, 23
 production, 23, 100

Phenanthrenes
 synthesis, 22

Phenol
 acetylation, 113
 alkylation, 33, 110, 111, 112, 113
 chlorination, 34
 determination, 36, 81
 etherification, 113
 hydrogenation, 34, 80
 oxidation, 34, 114
 oxidative coupling, 114
 preparation, 31, 32, 34
 production, 32, 113, 114
 in production of resins, 132
 properties, 14, 30, 33, 110
 purification, 31
 recovery, 9, 107
 removal from effluents, 9, 81
 synthesis, 30, 31, 106, 107, 108

Phenols
 acetylation, 113
 alkylation, 33, 110, 111, 112, 113
 analysis, 7, 35, 36, 37, 43, 78, 81, 115, 116
 condensation, 134
 disproportionation, 34
 hydrogenation, 34, 83
 isomerization, 34
 oxidation, 114
 production, 8, 30, 31, 33, 75, 106, 108, 109, 110
 in production of bactericides, 56
 of fungicides, 56
 of herbicides, 56
 of inhibitors, 60, 131, 132
 of tanning agents, 60

Phenols, Alky-
 analysis, 7, 35, 36, 81, 116
 dealkylation, 34, 114
 dehydrocyclization, 34
 disproportionation, 34
 distillation, 106
 hydrogenation, 34
 isomerization, 34
 preparation, 30, 33, 108, 109
 production, 33, 108, 109, 110, 111
 properties, 33, 110
 recovery, 30, 106
 separation, 30, 106
 synthesis, 30, 33, 108, 109, 111

Phenols - continued
 thermal cracking, 33
 transalkylation, 112
 uses, 30

Phenols, Dialkyl-
 alkylation, 110
 analysis, 7, 35, 36
 extraction, 30
 isomerization, 113
 oxyethylation, 33
 preparation, 32, 109, 110, 111, 113
 production, 111, 112, 113
 properties, 30, 33, 110
 purification, 30, 106
 recovery, 30
 separation, 30
 synthesis, 30, 33, 109, 110, 111

Phenols, Dihydric
 alkylation, 131
 analysis, 36, 116
 etherification, 113
 production, 34, 107
 in production of inhibitors, 132
 of insecticides, 57
 properties, 110
 separation, 36
 synthesis, 31

Phenols, Monohydric
 acetylation, 113
 alkylation, 33, 110, 111, 112
 analysis, 7, 35, 36, 78, 81, 115
 etherification, 113
 preparation, 31, 108, 109, 111, 112
 production, 8, 106, 108, 109, 110
 properties, 30, 33, 110
 recovery, 3, 9, 30, 106
 removal from effluents, 9
 separation, 30
 synthesis, 30, 31, 107, 108, 109, 110, 111, 112

Phenosolvan Process, 9

Phloroglucinol
 determination, 36

Phthalic Anhydride
 determination, 53
 production from anthracene, 24, 99
 from naphthalene, 21, 52, 53, 133, 134
 from phenanthrene, 24, 99
 from 1-tetralin, 99
 from o-xylene, 14, 52, 88, 133, 134
 purification, 53, 134

2-Picoline
 chlorination, 43
 determination, 7
 hydrogenation, 123
 production, 41, 120, 122
 properties, 40, 41, 121, 122
 purification, 119
 separation, 119
 synthesis, 121

3-Picoline
 determination, 124
 properties, 40, 121, 122
 purification, 119
 recovery, 39
 separation, 39, 119
 synthesis, 40, 120, 121

4-Picoline
 determination, 119, 124
 oxidation, 122
 properties, 40, 121, 122
 purification, 119
 recovery, 119

4-Picoline - continued

- separation, 119
- synthesis, 121

Picolines

- analysis, 124
- chlorination, 43
- oxidation, 122, 123
- preparation, 122
- production, 83, 119, 120, 121, 122
- properties, 40, 122
- purification, 119
- recovery, 119
- separation, 39, 119
- synthesis, 40, 120

2-Pipecoline

- production, 123
- properties, 87

Piperidine

- production, 42
- properties, 41, 87, 121, 122

Pitch

- in adhesives, 28, 104
- air-blowing, 28, 104
- analysis, 28, 29, 104, 105
- in anti-fouling compositions, 49
- as binder in briquettes, 131, 138, 139
- in carbon electrodes, 58, 136, 137, 138
- modification, 137
- properties, 58, 59, 137
- in graphite, 138
- properties, 138
- in moulding sands, 59, 139
- in refractories, 59
- in roads, 128
- characterization, 104
- coking, 57, 58, 59, 75, 136, 137
- coking value, 7, 58, 137
- composition, 78, 137
- continuous coking, 58
- in dampcourses, 130
- delayed coking, 57, 137
- in joint sealing membranes, 49
- mixtures with bitumen, 45
- with coal, 50, 58, 130, 131
- with oxidizing agents, 59
- with petroleum coke, 58, 137
- with polymers, 49, 128, 130, 137
- with resins, 49, 128
- with rubber, 49
- with sand, 104
- with sulphur, 50
- modification, 45, 104, 128, 137, 138
- in paints, 49, 129, 130
- in pipecoatings, 49, 129
- in pipewrapping tapes, 49, 50, 129, 130
- in plastic moulding materials, 50
- production, 7, 75, 78, 104
- in production of carbon black, 59
- properties, 28, 59, 104, 139
- pyrolysis, 139
- solvent fractionation, 29, 105, 137
- thermal treatment, 28, 58, 104, 136
- in thermoplastic foams, 50
- treatment with acetylene, 137
- with lignin sulphonate, 28

Pitch Coke

- anisotropic properties, 57
- calcination, 58
- desulphurization, 138
- production, 57, 76, 137
- in production of electrically conductive sheets, 130
- of electrodes, 57, 76, 137

Pitch Coke - continued

- of graphite, 57, 137
- of pipewrapping tapes, 130
- of tamping materials, 59
- of solid fuel, 57
- properties, 57, 58, 137, 138
- pyrolysis, 76
- testing, 137

Pitch Distillates

- analysis, 26, 101
- coking, 57
- distillation, 57
- extraction, 28, 97
- oxidation, 24, 57
- properties, 26
- in protective coatings, 28
- in road binders, 28
- in swelling agents for elastomers, 28
- in timber preservation, 28

Pitch Fibre Pipes, 130

Plastics and Resins, 51, 92, 132

Polyphenylene Oxide (PPO) Resins, 52, 134

- modification with phenols, 52
- preparation, 34, 134
- properties, 52

Propham, 57

Protective Coatings, 48, 129

Pyrene

- determination, 102
- ozonolysis, 25
- in production of resins, 54

Pyridine

- alkylation, 41
- determination, 43, 119, 124
- hydrogenation, 42
- in inhibitors, 60
- oxidation, 122, 123
- production, 41, 83, 119, 120, 122
- properties, 40, 41, 88, 121
- purification, 39
- recovery, 39, 119, 120
- removal from effluents, 81
- separation, 119, 120
- synthesis, 40, 120

Pyridine, Ethyl-

- determination, 43
- oxidation, 122, 123
- preparation, 123
- production, 41, 122
- properties, 122
- purification, 119
- separation, 119

Pyridines

- alkylation, 41, 42, 122
- analysis, 43, 78, 123, 124
- chlorination, 43
- dealkylation, 120, 122
- dehydrogenation, 120
- extraction, 119
- oxidation, 120, 122
- production, 39, 41, 120
- properties, 40, 121
- purification, 39, 119
- recovery, 39, 119
- separation, 39, 119
- synthesis, 40, 120

Pyrogallol

- determination, 36
- etherification, 113

Pyromellitic Acid

- production, 23, 92

Pyrotol Process, 90

Pyrroles
properties, 121

Q

Quinaldine
determination, 43, 125
hydrogenation, 42
properties, 41, 122
recovery, 39
separation, 39
Quinoline
alkylation, 42
determination, 43, 124
hydrogenation, 42
production, 96, 119, 120
properties, 41, 122
purification, 119, 120
recovery, 39
separation, 39, 43, 119, 120
Quinolines
analysis, 43, 78, 124
hydrogenation, 42
in inhibitors, 59
isomerization, 42
production, 42
properties, 41, 121, 122
purification, 119, 120
recovery, 39, 119, 120
separation, 39
synthesis, 121

R

Redex Process, 85
Resorcinol
determination, 36
etherification, 113
in production of adhesives, 53, 54
of resins, 132
polymerization, 134
Rexco Process, 3
Road Tar, 45, 127
adhesion, 45
anti-skid properties, 45, 127
emulsification, 48, 128, 129
mixtures with aggregate, 45, 127, 128
adhesion, 45, 47
compacting viscosity, 46
determination of content, 46
durability, 127
effect of salt on, 129
hardening, 45
laying, 47, 127
Marshall test, 46
metric conversion, 45
properties, 46, 127
road trials, 127
specifications, 127, 128
testing, 129
transport, 127
wheel tracking test, 127
modification with bitumen, 45, 128
with fatty acids, 129
with polymers, 45, 127, 128
production, 45
in slurry seals, 48
specifications, 45, 128
in surface dressing, 45, 127, 128
adhesion, 47
ageing, 47
bleeding, 47

Road Tar - continued
coating thickness, 46
cooling, 46
precoating of chippings, 47, 128
rate of spread, 46
road trials, 128
size of chippings, 46, 127
skid resistance, 128
specifications, 45, 128
spraying, 47
testing, 46, 127
volatility, 127
weathering, 127

S

Semiconductors, 92
Sevin
determination, 57
Slurry Seal, 48, 128
chemistry, 48
choice of aggregate, 48
of emulsifier, 48
rupture, 48
Solid Fuels, 50, 131
production from coal, 50, 131
from coal tar, 50
from phenolic effluents, 50
from pitch, 50
properties, 50
Solvent Extraction, 13, 150, 151
Sulphur Determination, 6, 64, 65, 144
in benzole, 6
in tar oils, 6, 7
Surface Tension Measurement, 68

T

Tar Acids, 30, 106
analysis, 6, 35, 43, 78, 115
cracking, 8
distillation, 78
hydrogenolysis, 33, 80
production, 8, 30, 75, 78
purification, 106
recovery, 75, 78
yield from lignite, 78
Tar Bases, 39, 119
ammonolysis, 92
ammoxidation, 92
analysis, 5, 6, 43, 78, 119, 123
hydrodealkylation, 122
hydrogenolysis, 33, 80
production, 33, 39, 78, 83
properties, 7
purification, 39
recovery, 39
separation, 5, 39, 78
synthesis, 40
Tar Distillates
analysis, 5, 6, 26
condensation with formaldehyde, 54
cracking, 8
distillation, 5, 7
hydrogenation, 4
hydrogenolysis, 33
production, 3
refining, 3
Terephthalic Acid
production, 53
Tetracene
properties, 23

1-Tetralone
production, 99

Thermal Conductivity Measurement, 67

Thionaphthen
production, 96
removal from naphthalene, 96, 99

Thiophen
determination, 93
effect in alkylation of benzene, 16
hydrogenolysis, 18
polymerization with indene, 83
properties, 13
recovery, 12
removal from benzene, 12, 83, 84

Thiophens
analysis, 93
removal from toluene, 84

Toluene
alkylation, 16, 89, 90
autoxidation, 88
benzylation, 16
cyclalkylation, 16
dealkylation, 17, 90, 91
decomposition, 100
determination, 18, 92
disproportionation, 17
extraction, 85
hydrodealkylation, 17, 90
hydrogenation, 92
oxidation, 15, 31, 88, 89, 107
oxygenation, 15
production, 17, 25, 83, 91
in production of resins, 133
properties, 13, 88, 87, 88
purification, 12
recovery, 12, 85
sulphonation, 32

Triphos Process, 9

U

Udex Process, 85

V

Vapour-Liquid Equilibria, 67, 87, 147

Vapour Pressure Measurement, 67, 147

Viscosity Measurement, 86, 148

W

Wash Oil
analysis, 93
in benzene recovery, 21, 23, 83
in effluent treatment, 9
hydrogenation, 42
in naphthalene recovery, 21, 83
properties, 23

Wood Preservation, 54, 135

X

Xylene, meta-
alkylation, 16, 89, 90
chlorination, 18
determination, 18
hydrogenation, 88
isomerization, 17, 18, 91
oxidation, 15, 88
oxygenation, 15
properties, 14, 87, 88
purification, 18
reaction with acetic anhydride, 18

Xylene – continued
recovery, 18, 85, 86
transalkylation, 91

Xylene, ortho-
alkylation, 109
chlorination, 18, 92
determination, 18
disproportionation, 17
hydrogenation, 92
isomerization, 17, 18, 91
oxidation 14, 88, 133, 134
to phthalic anhydride, 53, 134
reaction with acetic anhydride, 17
recovery, 85
production, 25

Xylene, para-
chlorination, 18
crystallization, 12, 13, 85
determination, 18
hydrogenation, 86
isomerization, 18, 91
polymerization, 52
production, 17
properties, 14, 88
purification, 12, 13, 86
reaction with acetic anhydride, 18
recovery, 13, 85

Xylenes
alkylation, 16, 89
analysis 18, 92
chlorination, 18
crystallization, 12, 13, 85
cyclalkylation, 16
dealkylation, 17, 90, 91
decomposition, 100
hydrodealkylation, 90
hydrogenation, 92
hydrolysis, 32
isomerization, 18, 91
oxidation, 15, 53, 88, 89
production, 15, 17, 83
in production of resins, 133
properties, 14, 87, 88
reaction with acetic anhydride, 18
separation, 12, 13, 85

2,3-Xylenol
production, 112
synthesis, 33, 108, 109

2,4-Xylenol
determination, 116
production, 111, 112
synthesis, 33, 111

2,6-Xylenol
determination, 36, 116
disproportionation, 112
extraction, 30
oxidation, 34, 114
oxidative coupling, 114
polymerization, 134
production, 33, 109, 110, 112
properties, 30
purification, 106
rearrangement, 33
recovery, 30, 106
synthesis, 33, 109, 110

3,4-Xylenol
synthesis, 108

3,5-Xylenol
determination, 115, 116
preparation, 32, 33, 109
purification, 109
synthesis, 109
transalkylation, 112

Xylenols

alkylation, 110
analysis, 36, 115, 116
hydrogenation, 34
isomerization, 113
preparation, 30, 32, 111
production, 30, 111, 112
in production of plasticizers, 54
of resins, 54
properties, 33
purification, 30, 106

Xylenols - continued

rearrangement, 33, 113
recovery, 30, 106
synthesis, 30, 33, 108
transalkylation, 112

Xylenes

production, 52

Z**Zone Refining, 70, 96**